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Researches of Developing Strategies and Guarantee Mechanism of Energy Saving and Emission Reduction on Paper-making Enterprises-Case Study of Shandong Haiyun High-Efficiency Ecological Park

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Abstract

Papermaking enterprises are major polluters that cause water pollution and air pollution. This paper aims to provide analysis of the energy saving and emission reduction in papermaking enterprises.It is the inevitable choice of establishment industrial ecology park as the leading of the papermaking industry by the implementation of cleaner production and circulation economy. Shandong Haiyun efficient ecological park is taken for example.Researches of the developing strategies and policy support of energy saving and emission reduction is discussed. The paper is divided into five parts, the first part is the preface, the second part introduces the general of Haiyun efficient industrial park, the third part puts forward the scheme of clean production of Haiyun efficient ecological industrial park, the fourth part puts forward ecological industry pattern of Haiyun efficient ecological industrial park, the fifth part puts forward policy guarantee measures, and the sixth part makes the summary.

Keywords: paper-making enterprises energy conservation and emission reduction clean production security Haiyun ecological park

1. Introduction

Papermaking industry is one of the important pillars in national economy in China. At present, China has become a big papermaking production, trade and consumer country, and the papermaking industry has entered the rapid development time. However, papermaking industry has lead a “polluting before

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governance" road in a long-term. Although our country make small-scale papermaking enterprises closed、suspended、merged、transformed、reorganized, make a series of policies, and that curbed the papermaking enterprises blind expansion to a certain extent. But so far, the papermaking enterprises is still one of major polluters that cause water pollution and air pollution. Cleaner production has become the main stream of sustainable development of the international papermaking industry. Making cleaner production and building resource-conserving and environment-friendly papermaking enterprise is the indispensable road of sustainable development of the papermaking industry. The paper takes Shandong Haiyun ecological paper Co. LTD for example, basing on the construction of ecological industry park to discuss strategy and security support of energy saving and emission reduction in papermaking enterprises.

2. The profile of Haiyun efficient ecological industrial park

Haiyun efficient ecological park is the industrial park that Shandong Haiyun ecological paper Co., LTD. use enterprise's move to transform and build. Park is 6.5 km far from factory and 6 km far from Zhanhua. Park has no large polluting enterprises and has little impact on the environment. Environmental air quality is overall good in the region, but the water environmental quality is worse. The ecological environment is overall good. Park makes energy conservation and emission reduction as the key point, will make the development of pulp &paper ecological industry combined with ecological protection and the renovation of regional environment, will make development of pulp and paper ecological industry combined with exerting regional comparative advantage and enhancing the market competitive power, will make regional transformation combined with the adjustment of industrial structure, and will finally realize energy conservation and emission reduction of ecological paper in Haiyun.

3. The clean production plan of Haiyun efficient ecological park

Haiyun efficient ecological park will take the development mode of recycle economy. Its construction will be firstly based on each enterprise, implement cleaner production in the enterprise, be based on the control of the production process of the prevention of pollution, realize optimizing investment structure of the resources, and realize coordinated development between papermaking industry and environment. In view of the industry characteristics of papermaking enterprises， if the papermaking enterprises want to implement cleaner production they should find the effective way of clean production in product design, material selection, technological process, process parameters and production equipment, operation norm etc, and promote the implementation of cleaner production. Specific cleaner production plans are below.

3.1. The optimization of raw material structure

Paper making materials of Haiyun ecological paper is mainly reed now. In order to further optimize material structure, they should constantly improve the proportion of waste paper and trees, reduce the consumption of fiber materials, energy and water, and reduce environment pollution of the paper class waste. In addition, we should establish papermaking Lin base, develop mill papermaking, change the present situation that the proportion of non-lumber fibrous papermaking is significant, and obtain environment economic benefits of clean production at a relatively low cost.

3.2. The innovation of production technology and the choice of production equipment

To achieve the target of clean production, the papermaking enterprises must adopt advanced production techniques and equipment. On the one hand, that can eliminate backward technology, on the other hand, which can realize the upgrade of products, improve the market competitiveness of products, and is helpful for the sustainable development of the enterprises. The enterprises must strictly choose the process route according to the requirements of cleaner production, and refuse to resolutely use processing route that may cause excessive energy consumption and a large number of trash in the process of

production. At the same time, they should strengthen applied R&D of cleaner production process route, and provide technical support for clean production.

3.3. The control of production process and technology improvement

The enterprises should choose clean raw materials and accessories in the preparation stage, strictly control the quality of raw materials and accessories, and that is vital important for subsequent process of production and emission level of pollution; the improvement of pulping technology mainly reflects in high yield pulping, the technology of depth off lignin and the technology of biological pulping; the improvement of bleaching technology is mainly to adopt no element chlorine bleaching (ECF) and completely without non-chlorine bleach (TCF) technology, and that can achieve the purpose of energy saving and efficiency.

3.4. Waste recycling

The cleaner production of this link mainly contain the treatment of cooking tail gas, recovery of waste, recovery of black liquor, recovery of tail water, treatment and reuse of reclaimed water, recycle of tail water, reuse of condensed water and cogeneration.

3.5. Strengthen management, improve the quality of employees

The cleaner production management should be decomposed into each link of the enterprise production according to the concept of the control of all the process, and is closely integrated with production management. At the same time, the enterprises should regularly make technical training to enterprise staff, and constantly improve the staff's technological literacy; formulate incentives to encourage employees to put forward rationalization suggestion, and improve the staff's cleaner production consciousness.

4. The construction of ecology industrial mode of Haiyun efficient ecological park

Build industrial model of efficient ecological park in Rhine, the first is to establish a consistent industrial system for industrial park, define and plan leading industries in the industrial system. The leading industries in the eco-industrial park include reed planting, pulp paper industry, ecological tourism, environmental protection industry, basic services and other industries. Based on the analysis of industrial sectors within the system and the metabolic relationship between the material energy between the industries in the industrial park, to establish ecological industrial chain under the concept of recycling economy. Convergence of these value chains, operations and network to achieve eco-industrial development goals of industrial parks.

4.1. Construction of the Main Industrial chain in Industrial Park

Around the ecosystem Paper production projects in Rhine, fostering an industrial chain based on a reed paper, paper integration, paper pulp , and extends to the printing and publishing, production of raw materials and additives, thermoelectric industry, building materials, logistics Services, eco-tourism and other related supporting industries, Rhine formed a regional concentration of industries associated with high industrial layout. Include: (1) reed pulp paper and paper integration ecological chain; (2)an environmentally friendly industrial chain of waste disposal and utilization; (3)a recycling industry chain to save and sewage water; (4) ecological Tourism chain: reed growing System→ eco-tourism System →Sewage treatment system→ reed growing System; (5) hot ecosystem. Through the construction of the above industrial chain, this five ecological chains reflects a vertical closed relationship: "the source →together→ source ". Several ecological chains cross and connect with each other, forming a network structure, the system realizes the resource sharing, achieves the integration of the resources, environment, technology, to maximize material use and minimize waste output. This structure of eco-industrial park

with greater flexibility to the range of products, the production scale of the supply of resources, market demand and the random fluctuations in the external environment, enhance the overall ability to withstand market risks greatly, the ecological industrial park showed strong Flexibility.

4.2. Partition function and industrial layout of industrial park

The space layout of Eco-industrial and efficient park in the Rhine, follow the principle of "big scattered, small concentration, to distinguish between levels and differential treatment". Industrial Park Function Division consists of three parts: the eco-paper industry area: in the middle of industrial park, including the Area of production, Public Works Area, Area in front of the plant, waste water treatment and processing of bio-organic fertilizer concentrate and aquaculture Area, logistics Service Area; Extended functional areas: in the south of industrial park, including seedling plants and R & D area Seedling plant which is mainly used for seedlings and testing of the cultivation. R & D area, mainly for villa projects for the expert, production research and development center, spa bath, five-star hotel, Chinese Academy of Sciences grass research center. This area is mainly used for internal scientific research and external personnel for the hospitality and rest; support functional areas: is located in the northern of industrial park, including forestation test area and water project area.

5. The measures to construction of efficient and eco-industrial park in Rhine.

5.1. policy measures

Development of construction and management and related implementation details for industrial park, to ensure implementation and enforcement of the state and local government laws, regulations. study and formulate the economic policies to encourage industrial park to develop eco-industry. Through preferential taxation, loans, financial subsidies, land use, etc., to enhance policy support to the industrial park. expand the financing channels of Eco-industrial park, provide key support for the key projects of building industrial park from on policy.

5.2. Talent introduction and training measures.

And improve the incentive mechanism; establish a dynamic employment system to adapt to the market economic system. Around the priority areas and key technologies of the construction and environmental protection of Eco-industrial park, the priority areas and key technologies including the key and difficult issues in the ecological construction, environmental protection, clean production, resource utilization, eco-tourism development and development of the green fields of industry in and new industries , development of New industries, new varieties and new technology, speed up the technological innovation of the construction of ecological zones , to establish cooperation with domestic universities and research institutes in ecological construction, to establish libraries for environmental experts to provide technical support for the construction of industrial parks.

5.3. Technical Support

Technical support including information communication technology system, research and development of ecological industrial technology, ecological design, eco-industrial incubator and stable operation of risk contingency plan of eco-industrial park. Among them, the information systems support the decision-making in the organizations, coordination, collection of control and analysis of information, transmission, processing, storing, processing, maintain and use a collection of interrelated working parts; Eco-technology industry has the ability to digest its own cleverly waste generated, recycling natural resources, recycling energy, closure of waste utilization, industrial products only available to the community And raw materials, do not leave any waste to the environment in the industrial production process.Eco-design

activities mainly consists of two aspects of meaning, one from the perspective of protecting the environment, reduce resource consumption to achieve sustainable development strategy; the second is from a commercial point of view, lower costs, reduce potential liability risk, to improve competitiveness; industrial park is the "incubator" of Circular economy, through the approach to establishment of eco-industrial park to realize the cycle of the material flow energy flow between the enterprise. to minimize emissions of By-products and industrial waste; contingency plans to ensure that the industrial park have a safe and stable living and working environment, with a convenient, and orderly manner to deal with emergencies in emergency situations, to reduce and minimize the impact and losses to a minimum.

5.4. Environmental management tools

ISO14000 Environmental Management Standard is a set of tools to environmental management, different tools for different environmental management environmental management issues. In general, these environmental management tools can be divided into two groups: organizations (enterprises) related and product-related tools. In addition to LCA methods, other environmental management tools include environmental management systems, environmental auditing, environmental labeling and environmental behavior evaluation.

5.5. Public Participation

Public participation is an individual or organization through a certain way and procedures , directly or indirectly express of individual or collective interests, wishes and ideas on public policy formulation, implementation and effect to influence policy formulation, implementation and improvement.

6. Conclusion

The efficient ecological industrial park in Rhine is through the scientific use of reed to form a "resources - products - resources "as the main line of industrial chain of the ecological cycle to minimize pollution, waste into resources and harmless, to explore new paths and accumulate new experience for our resources development and Utilization and eco-paper industry ,to provide Operational example for the recycling economy, ecological paper industry.The construction of eco-industrial and efficient park in Rhine in line with international trends in paper industry, will achieve reed pulp and paper, pulp and paper integration, product diversification, clean production, resource conservation and so on, in order to achieve high efficiency, high Quality, low-cost, zero emissions, contribute to the formation of polycyclic complementary high value-added industry chain to enhance the enterprise content and added value of industrial technology to provide competitive strength.

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